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| EXAMINER | |
|---|---|
| REGO, DOMINIC E | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/809,996 | KRISHNAN ET AL. | |
| | Examiner | Art Unit | |
| | DOMINIC E. REGO | 2618 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 December 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3-20,22-39 and 41-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-20,22-39,41-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

**1.** This communication is responsive to the application filed on December 29, 2009.

Claims 1,3-20,22-39,41-48 are pending and presented for prosecution.

Claims 20 and 39 have been amended and new claims 47-48 have been added.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,3-6,8-11,13-16,18-20, 22-25,27-30,32-35,37-39, 41-43, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (US Patent #7,184,767) in view of Choi (US Patent #6,967,944).

**Regarding claim 1**, Gandolfo teaches a method of communications from a piconet (Figure 6C), comprising:

engaging in intra-piconet communications *(Figure 6C, engaging in intra-piconet communications between device A2-522a and B2-522b; Col 11, lines 47-58: Gandolfo teaches in FIG. 6C, device A-2 522a in network A 505a is controller-enabled (i.e., it is capable of becoming a controller). And when device A-2 522a forms a child network, the usable physical area 560a of that child network is large enough to contain device B-2*

*522b. Similarly, if device B-2 522b in network B 505b were also controller-enabled (i.e., capable of becoming a controller), then it could form a child network whose usable physical area 560b was large enough to contain device A-2 522a. Regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, so devices 522a and 522b engaging in intra-piconet communication)*;

receiving a pilot signal from a foreign terminal outside the piconet *(Col 11, lines 55-58: Regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590. In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer(ad-hoc) connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is inside the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer (ad-hoc) connection with each other in order to exchange messages from network 550a to 550b or vice versa)*;

determining strength of the pilot signal (*In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network,*

*and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer (ad-hoc) connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is within the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b outside the cell 550a, receiving signal strength of the pilot signal by controller 510a is less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer(ad-hoc) connection with each other in order to exchange messages from network 550a to 550b or vice versa);*

exchanging messages with the foreign terminal if the pilot signal is below the threshold *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, means exchanging messages with the foreign terminal. In another word, when device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer (ad-hoc) connection with each other in order to exchange messages from network 550a to 550b or vice versa );*

establishing a peer-to-peer (ad-hoc) connection with the foreign terminal *(Col 11, lines 47-58: Gandolfo teaches r<u>egardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590.</u> In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C),*

*one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer (ad-hoc) connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages).*

Even though, Gandolfo doesn't specifically teach in the disclosure that exchanging messages with the foreign terminal if the pilot signal is below the threshold, but the reason for forming child network and engaging peer-to-peer (ad-hoc) communication is to when the controller 510a (master terminal) could not connected with device B-2 522b because device B-2 522b located outer range of cell 550a, so the pilot signal strength must be less than threshold, by forming peer-to-peer (ad-hoc) connection with it's edge terminal 522a with the remote or the foreign terminal 522b will able to engage communication with each other.

However, related art, Choi, Col 5, lines 9-31, teaches the AP 14 updates the table to reflect the received signal strength level for each active STA then newly allocates time allocation for all STAs. Based on the updated information, the AP 14 can determine which stations are hidden from each other. If the received signal quality degrades below a set limit, a subsequent frame message from the AP 14 to the active STAs is transmitted to designate time allocation for multiple peer-to-peer (ad-hoc) transmissions. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Choi to Gandolfo, in order to have peer-to-peer (ad-hoc) communication with the foreign terminal, so that the data

can be transmitted constantly without deteriorating.

**Regarding claims 3 and 22**, the combination of Gandolfo and Choi teach all the claimed elements in claims 1 and 20. In addition, Gandolfo teaches the method wherein the exchanged messages comprise a transmission to the foreign terminal including a list of a plurality of terminals in the piconet *(Col 11, line 20-Col 12, line 63, especially Col 12, lines 56-63, Gandolfo teaches each controller 510a, 510b will then be responsible for transmitting a broadcast message (beacon or other transmission) at a regular interval (e.g., every second or two). This broadcast message should include a list of all the devices that are associated to it, the type of service provided by each one of its associated devices, as well as some additional information such as supported data rate, available wired connections to the outside world, and other fields as needed).*

**Regarding claims 4 and 23,** the combination of Gandolfo and Choi teach all the claimed elements in claims 3 and 22. In addition, Gandolfo teaches the method wherein the foreign terminal is a member of a remote piconet *(See fig 6C, foreign terminal 522b is a member of a remote piconet 550b)*, and wherein the exchanged messages comprise receiving from the foreign terminal a list of a plurality of terminals in the remote piconet *(Col 11, line 20-Col 12, line 63, especially Col 12, lines 56-63, Gandolfo teaches each controller 510a, 510b will then be responsible for transmitting a broadcast message (beacon or other transmission) at a regular interval (e.g., every second or two). This broadcast message should include a list of all the devices that are associated to it, the type of service provided by each one of its associated devices, as well as some additional information such as supported data rate, available wired connections to the*

*outside world, and other fields as needed)*.

**Regarding claims 5 and 24**, the combination of Gandolfo and Choi teach all the claimed elements in claims 4 and 23. In addition, Gandolfo teaches the method further comprising mapping the list of terminals in the remote piconet to the foreign terminal (Col 11, line 20-Col 12, line 63, especially Col 12, lines 56-63, *(Col 11, line 20-Col 12, line 63, especially Col 12, lines 56-63, Gandolfo teaches each controller 510a, 510b will then be responsible for transmitting a broadcast message (beacon or other transmission) at a regular interval (e.g., every second or two). This broadcast message should include a list of all the devices that are associated to it, the type of service provided by each one of its associated devices, as well as some additional information such as supported data rate, available wired connections to the outside world, and other fields as needed)*.

**Regarding claims 6 and 25**, the combination of Gandolfo and Choi teach all the claimed elements in claim 1 and 20. In addition, Gandolfo teaches the method wherein the establishment of the peer-to-peer connection comprises negotiating a data rate and transmission power level (Col 12, lines 12-20, lines 56-63).

**Regarding claims 8 and 27**, the combination of Gandolfo and Choi teach all the claimed elements in claim 1 and 20. In addition, Gandolfo teaches the method further comprising listening for a transmission from the foreign terminal when not engaged in the intra-piconet communications *(Figure 6C, Gandolfo teaches element 522a listening for a transmission from the foreign terminal 522b when not engaged in the intra-piconet communication (Col 11, lines 20-58)*.

**Regarding claims 9 and 28**, the combination of Gandolfo and Choi teach all the claimed elements in claims 8 and 20. In addition, Gandolfo teaches the method wherein the transmission is received while listening for it, the method further comprising forwarding the received transmission to a terminal within the piconet (Col 11, lines 20-58).

**Regarding claims 10 and 29**, the combination of Gandolfo and Choi teach all the claimed elements in claims 9 and 28. In addition, Gandolfo teaches the method further comprising receiving instructions to engage in the intra-piconet communications during a first time period and to forward the received transmission to the terminal in a second time period (Col 11, lines 20-58; Col 12, lines 56-67).

**Regarding claims 11 and 30**, the combination of Gandolfo and Choi teach all the claimed elements in claims 10 and 29. In addition, Gandolfo teaches the method wherein the first time period is different from the second time period (Col 11, lines 20-58; Col 12, lines 56-67).

**Regarding claims 13 and 32**, the combination of Gandolfo and Choi teach all the claimed elements in claims 9 and 28. In addition, Gandolfo teaches the method further comprising providing feedback to the foreign terminal acknowledging that the transmission from the foreign terminal was received (Col 5, lines 43-51; Col 11, lines 47-58; and Col 13, lines 24-42, especially, Col 13, lines 24-42).

**Regarding claims 14 and 33**, the combination of Gandolfo and Choi teach all the claimed elements in claims 1 and 20. In addition, Gandolfo teaches the method

further comprising receiving a transmission from a terminal within the piconet, and forwarding the received transmission to the foreign terminal (Col 11, lines 47-58).

**Regarding claims 15 and 34**, the combination of Gandolfo and Choi teach all the claimed elements in claims 14 and 33. In addition, Gandolfo teaches the method further comprising receiving instructions to engage in the intra-piconet communications during a first time period *(Figure 6C, receiving instructions to engage in the intra-piconet communications during a first period from controller 510a in view of device A2 522a)*, receiving the transmission from the terminal in a second time period *(Figure 6C, receiving the transmission from the terminal A2-522a in a second time period)*, and forwarding the received transmission to the foreign terminal in a third time period (*Figure 6C, forwarding the received transmission to the foreign terminal B2-522b in a third time period;* Col 11, line 46-Col 12, line 20).

**Regarding claims 16 and 35**, the combination of Gandolfo and Choi teach all the claimed elements in claims 15 and 34. In addition, Gandolfo teaches the method wherein the first, second and third time period are all different from one another (Col 11, line 46-Col 12, line 20).

**Regarding claims 18 and 37**, the combination of Gandolfo and Choi teach all the claimed elements in claims 14 and 33. In addition, Gandolfo teaches the method further comprising receiving feedback from the foreign terminal indicating that the received transmission forwarded to the foreign terminal was received by the foreign terminal (Col 11, line 46-Col 12, line 20; Col 12, lines 56-63, especially, Col 12, lines 56-63).

**Regarding claims 19 and 38**, the combination of Gandolfo and Choi teach all the claimed elements in claim 14 and 33. In addition, Gandolfo teaches the method wherein the forwarding of the received transmission to the foreign terminal comprises transmitting the received transmission to the foreign terminal a plurality of times (Col 11, line 46-Col 12, line 20).

**Regarding claim 20**, Gandolfo teaches a communications terminal configured to operate in a piconet (Figure 6C), comprising:

a receiver configured to detect a pilot signal from a foreign terminal outside the piconet and determine its strength *(Col 11, lines 55-58: Regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590._In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is inside the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa);*

a controller configured to exchange message with the foreign terminal *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590. See Fig 6C, controller 510a configured to exchange message through it's edge terminal 522a with the foreign terminal 522b)* to facilitate establishing a peer-to-peer connection with the foreign terminal if the pilot signal strength is below a threshold *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, means exchanging messages with the foreign terminal. In another word, when device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa)*,

the controller further being configured to support intra-piconet communications (*Figure 6C, engaging in intra-piconet communications between device A2-522a and B2-522b; Col 11, lines 47-58: Gandolfo teaches in FIG. 6C, device A-2 522a in network A 505a is controller-enabled (i.e., it is capable of becoming a controller). And when device A-2 522a forms a child network, the usable physical area 560a of that child network is large enough to contain device B-2 522b. Similarly, if device B-2 522b in network B 505b were also controller-enabled (i.e., capable of becoming a controller), then it could form a child network whose usable physical area 560b was large enough to contain device A-2 522a. Regardless of which device 522a, 522b created the child network, the*

*two devices 522a and 522b communicate with each other via a child wireless links 590, so devices 522a and 522b engaging in intra-piconet communication. Further in abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is inside the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b outside the cell 550a, receiving signal strength of the pilot signal by controller 510a should be less than threshold and this is the reason device 522a and 522b form peer-to-peer connection in order to transfer or exchange messages from network 550a to 550b or vice versa*).

Even though, Gandolfo doesn't specifically teach in the disclosure that exchanging messages with the foreign terminal if the pilot signal is below the threshold, but the reason for forming child network and engaging peer-to-peer communication is to when the controller 510a (master terminal) could not connected with device B-2 522b because device B-2 522b located outer range of cell 550a, so the pilot signal strength must be less than threshold, by forming peer-to-peer connection with it's edge terminal 522a with the remote or the foreign terminal 522b will be able to engage communication with each other.

However, related art, Choi, Col 5, lines 9-31, teaches the AP 14 updates the table to reflect the received signal strength level for each active STA then newly allocates time allocation for all STAs. Based on the updated information, the AP 14 can determine which stations are hidden from each other. If the received signal quality degrades below a set limit, a subsequent frame message from the AP 14 to the active STAs is transmitted to designate time allocation for multiple peer-to-peer transmissions. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Choi to Gandolfo, in order to have peer-to-peer communication with the foreign terminal, so that the data can be transmitted constantly without deteriorating.

**Regarding claim 39**, Gandolfo teaches a communications terminal configured to operate in a piconet (Figure 6C), comprising:

means for detecting a pilot signal from a foreign terminal outside the piconet *(Col 11, lines 55-58: Regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590. In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is inside the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b*

*located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa)*;

means for determining the strength of the detected pilot signal (*In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is within the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b outside the cell 550a, receiving signal strength of the pilot signal by controller 510a is less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa);*

means for exchanging messages with the foreign terminal *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590. See Fig 6C, controller 510a configured to exchange message through it's edge terminal 522a with the foreign terminal 522b)* to facilitate establishing a peer-to-peer connection with the foreign terminal if the pilot signal strength is below a threshold *(Col 11, lines 47-*

*58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, means exchanging messages with the foreign terminal. In another word, when device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa);* and

means for supporting intra-piconet communications *(Figure 6C, engaging in intra-piconet communications between device A2-522a and B2-522b; Col 11, lines 47-58: Gandolfo teaches in FIG. 6C, device A-2 522a in network A 505a is controller-enabled (i.e., it is capable of becoming a controller). And when device A-2 522a forms a child network, the usable physical area 560a of that child network is large enough to contain device B-2 522b. Similarly, if device B-2 522b in network B 505b were also controller-enabled (i.e., capable of becoming a controller), then it could form a child network whose usable physical area 560b was large enough to contain device A-2 522a. Regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, so devices 522a and 522b engaging in intra-piconet communication)*,

Even though, Gandolfo doesn't specifically teach in the disclosure that exchanging messages with the foreign terminal if the pilot signal is below the threshold, but the reason for forming child network and engaging peer-to-peer communication is to when the controller 510a (master terminal) could not connected with device B-2 522b

because device B-2 522b located outer range of cell 550a, so the pilot signal strength must be less than threshold, by forming peer-to-peer connection with it's edge terminal 522a with the remote or the foreign terminal 522b will be able to engage communication with each other.

However, related art, Choi, Col 5, lines 9-31, teaches the AP 14 updates the table to reflect the received signal strength level for each active STA then newly allocates time allocation for all STAs. Based on the updated information, the AP 14 can determine which stations are hidden from each other. If the received signal quality degrades below a set limit, a subsequent frame message from the AP 14 to the active STAs is transmitted to designate time allocation for multiple peer-to-peer transmissions. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Choi to Gandolfo, in order to have peer-to-peer communication with the foreign terminal, so that the data can be transmitted constantly without deteriorating.

**Regarding claim 41**, the combination of Gandolfo and Choi teaches all the claimed elements in claim 1. In addition, Gandolfo teaches the method, wherein engaging in intra-piconet communications further comprises: receiving a pilot signal from a master terminal; determining that the strength of the pilot signal from the master terminal is below a threshold; and transmitting a pilot signal (Col 5, lines 20-41 and *Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 59. In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C),*

*one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means device 522b receives a pilot signal from a controller 510a or a master terminal wherein device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa*);

establishing a new piconet in response to a foreign terminal requesting synchronous communication (*Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, so establishing a new piconet in response to a foreign terminal requesting synchronous communication)*.

**Regarding claim 42**, the combination of Gandolfo and Choi teach all the claimed elements in claim 1. In addition, Choi teaches the communications terminal, wherein the receiver is further configured to detect a pilot signal from a master terminal and determine its strength, and the controller is further configured to transmit a pilot signal if the pilot signal from the master terminal strength is below a threshold Col 5, lines 20-41 and *Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 59. In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That*

*means device 522b receives a pilot signal from a controller 510a or a master terminal wherein device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa*).

**Regarding claim 43**, the combination of Gandolfo and Choi teach all the claimed elements in claim 42. In addition, Choi teaches the communications terminal, wherein the controller is further configured to establish a new piconet in response to a foreign terminal requesting synchronous communication (*Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, so establishing a new piconet in response to a foreign terminal requesting synchronous communication)*.

**Regarding claim 46**, Gandolfo teaches a communication device configured to:

from a master terminal (Fig 6C, item 510a) of a piconet, receive a designation as an edge terminal (Fig 6C, device 522a) in the piconet *(Fig 6C, from a master terminal 510a of a piconet, receive a designation as an edge terminal 522a in the piconet);*

based on being designated an edge terminal 522a (Fig 6C), listen for pilot signals from isolated terminals 522b not included in the piconet 550a *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590. In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from*

*each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer connection with it's edge terminal 522a with the foreign terminal 522b in order to exchange messages)* ;

if a pilot signal with a signal strength below a threshold is detected from an isolated terminal 522b, add the isolated terminal 522b to a peer-to-peer connectivity list *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590, means exchanging messages with the foreign terminal. In another word, when device 522b, an isolated terminal which is located outside the cell 550a receiving signal strength less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa)*, the peer-to-peer connectivity list identifying terminals outside the piconet that may be reached with peer-to-peer transmission *(Col 11, lines 47-58: Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590. In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from*

*device 522b is below the threshold, establishing a peer-to-peer connection with it's edge terminal 522a with the foreign terminal 522b in order to exchange messages)*; and

route a call from the isolated terminal 522b (fig 6C) to a far-end terminal 522a of the piconet 550a *(In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer connection with it's edge terminal 522a with the isolated terminal 522b in order to exchange messages or routing a call)*, based on being included in a peer-to-peer *(Col 5, lines 20-24: ad-hoc network which same as peer-to-peer network)* connectivity list of the isolated terminal identifying each known edge terminal of the piconet *(Col 11, line 20-Col 12, line 63, especially Col 12, lines 56-63)*.

Even though, Gandolfo doesn't specifically teach in the disclosure that exchanging messages with the foreign terminal if the pilot signal is below the threshold, but the reason for forming child network and engaging peer-to-peer communication is to when the controller 510a (master terminal) could not connected with device B-2 522b because device B-2 522b located outer range of cell 550a, so the pilot signal strength must be less than threshold, by forming peer-to-peer connection with it's edge terminal 522a with the remote or the foreign terminal 522b will able to engage communication with each other.

However, related art, Choi, Col 5, lines 9-31, teaches the AP 14 updates the table to reflect the received signal strength level for each active STA then newly

allocates time allocation for all STAs. Based on the updated information, the AP 14 can determine which stations are hidden from each other. If the received signal quality degrades below a set limit, a subsequent frame message from the AP 14 to the active STAs is transmitted to designate time allocation for multiple peer-to-peer transmissions. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Choi to Gandolfo, in order to have peer-to-peer communication with the foreign terminal, so that the data can be transmitted constantly without deteriorating.

**Regarding claim 47**, Gandolfo teaches the communications terminal of claim 20, wherein the controller is further configured to determine whether the communications terminal has been designated as a piconet edge terminal, and if so, enable the receiver to detect the pilot signal *(Col 11, line 20-Col 12, line 7, especially Col 11, lines 31-40 teaches in an indirect overlap situation, neither of the usable physical areas 550a and 550b of the two networks 505a and 505b overlap. Thus, none of the controllers 510a, 510b can learn about the existence and settings of the other network 505a, 505b either directly from the other controller 510a, 510b, or through a device in the other network 505a, 505b. This is because each controller 510a, 510b cannot communicate with any of the elements of the other network 505a, 505b. However, where there is an indirect overlap, at least one controller-enabled device (designated as a piconet edge terminal) from one of the networks 505a, 505b may be capable of forming a child network (i.e., a network within an existing network) such that at least one device from the other existing*

*network 505a, 505b is within the usable physical area 560a, 560b of that child network. Means edge terminal 522a enable to detect the pilot signal).*

**Regarding claim 48**, the combination of Gandolfo and Choi teach all the claimed elements in claim 47. In addition, Gandolfo teaches the communications terminal of claim 47, wherein the controller is further configured to:

monitor an exchange of signaling messages pursuant to a call between a local terminal in the piconet, and a remote terminal outside the piconet *(Col 11, line 65-Col 12, line 7, Gandolfo teaches in the indirect overlap situation disclosed in FIG. 6C, device A-2 522a learns about the existence and settings of network B 505b by monitoring its beacon messages that are forwarded by device B-2 522b. Device A-2 522a then forwards this information to the controller 510a for network A 505a. Similarly, device B-2 522b learns about the existence and settings of network A 505a by monitoring its beacon messages that are forwarded by device A-2 522a. Device B-2 522b then forwards this information to the controller 510b for network B 505b)*;

determine whether the call involves high-latency communications (Col *11, line 65-Col 12, line 7, beacon messages)*; and

if so, provide feedback relating to the call between the local terminal and the remote terminal *(Col 11, line 65-Col 12, line 7, Gandolfo teaches in the indirect overlap situation disclosed in FIG. 6C, device A-2 522a learns about the existence and settings of network B 505b by monitoring its beacon messages that are forwarded by device B-2 522b. Device A-2 522a then forwards this information to the controller 510a for network*

*A 505a. In this way, the controller 510a provide feedback to both edge terminal 522a and remote terminal 522b to ensure that data transmission is properly received).*

4. Claims 7,12,26, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (US Patent #7,184,767) in view of Choi (US Patent #6,967,944), and further in view of Watanabe et al. (US 2002/0080855).

**Regarding claims 7 and 26**, the combination of Gandolfo and Choi teach all the claimed elements in claims 6 and 25. In addition, Gandolfo teaches the method/the communication terminal wherein the establishment of the peer-to-peer (Col 5, lines 20-24, ad-hoc) connection, but do not teach further comprises negotiating code to spread peer-to-peer communications.

However, in related art, Watanabe teaches the method/the communication device further comprises negotiating code to spread peer-to-peer communications (Paragraph 0027). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Watanabe to Gandolfo and Choi in order to perform frequency hopping using a plurality of frequency channels having different frequencies and defined in a usable frequency band (Watanabe, See abstract).

**Regarding claims 12 and 31**, the combination of Gandolfo and Choi fail to teach the method further comprising spreading the received transmission with a code.

However, in related art, Watanabe teaches the method further comprising spreading the received transmission with a code (Paragraph 0027). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Watanabe to Gandolfo and Choi in order to perform frequency hopping using a plurality of frequency channels having different frequencies and defined in a usable frequency band (Watanabe, See abstract).

5. Claims 17 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (US Patent #7,184,767) in view of Choi (US Patent #6,967,944), and further in view of Papasakellariou et al. (US Patent # 7,133,435).

6. **Regarding claims 17 and 36,** the combination of Gandolfo and Choi fail to teach the method wherein the received transmission is spread with a first code, the method further comprising despreading the received transmission with the first code and spreading the received transmission with a second code.

However, in related art, Papasakellariou teaches the method wherein the received transmission is spread with a first code, the method further comprising despreading the received transmission with the first code and spreading the received transmission with a second code (See claim 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Papasakellariou to Gandolfo and Choi in order to receive signals properly.

7. Claims 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gandolfo (US Patent #7,184,767) in view of Choi (US Patent #6,967,944), and further in view of Icacono et al. (US Pub. No. 2005/0176468).

**Regarding claim 44**, the combination of Gandolfo and Choi fail to teach the method, further comprising: determining that the strength of the pilot signal is above the threshold; and registering as member of a piconet with the foreign terminal.

However, in related art, Icacono teaches the method, further comprising: determining that the strength of the pilot signal is above the threshold; and registering as member of a piconet with the foreign terminal (Paragraphs 0032,0034, and 0037). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the above teaching of Icacono to Gandolfo and Choi in order to communicate with the selected cell.

**Regarding claim 45**, the combination of Gandolfo and Choi fail to teach the communications terminal, wherein the controller further configured to register as a member of a piconet with the foreign terminal to support communications if the pilot signal strength is above the threshold.

However, in related art, Icacono teaches the communications terminal, wherein the controller further configured to register as a member of a piconet with the foreign terminal to support communications if the pilot signal strength is above the threshold (Paragraphs 0032,0034, and 0037). Therefore, it would have been obvious to one of

ordinary skill in the art at the time of the invention to provide the above teaching of Icacono to Gandolfo and Choi in order to communicate with the selected cell.

***Response to Arguments***

8. Applicant's arguments with respect to claims 1,3-20,22-39, and 41-48 have been considered but are moot in view of the new ground(s) of rejection.

Regarding claim 1, Applicant argues the connection between elements 522a and 522b of Gandolfo is not a peer-to-peer connection, but instead, a master-slave or client-server connection, Where the elements 522a and 522b act as proxies for controller elements. The Examiner respectfully disagrees. Col 5, lines 20-24, Gandolfo teaches "Some of these objects are accomplished by way of discovering and updating the wireless links between multiple wireless networks and building communication paths across the multi-hop ad-hoc network", wherein ad-hoc network is a peer-to-peer network. According to web address https://www.novapublishers.com/catalog/product_info.php?products_id=5556, the definition of ad-hoc network in lines 4-5: "The simplest ad hoc network is peer-to-peer network". So communication between device A-2 522a and B-2 522b in figure 6C is definitely peer-to-peer communication or mobile-to-mobile communication. Further, Applicant argues that none of the limitations of claims 1, 20,39, and 46 are taught by Gandolfo in view of Choi. The Examiner respectfully disagrees. Col 11, lines 55-58, Gandolfo teaches regardless of which device 522a, 522b created the child network, the two devices 522a and 522b communicate with each other via a child wireless links 590.

In abstract, Gandolfo teaches if they have indirect overlap (Fig 6C), one device from each network will together in a child network, and the controllers will pass the network information via the devices in this child network. *That means when controller 510a detects that receiving pilot signal from device 522b is below the threshold, establishing a peer-to-peer (ad-hoc) connection with its edge terminal 522a with the foreign terminal 522b in order to exchange messages. If device 522b is inside the cell 550a, signal strength would be higher than threshold and communication would be normal. Since device 522b located outside the cell 550a, receiving signal strength of the pilot signal by controller 510a would be less than threshold, so either devices 522a and 522b form child network and establish peer-to-peer connection with each other in order to exchange messages from network 550a to 550b or vice versa*. Further, Choi, Col 5, lines 9-31, teaches the AP 14 updates the table to reflect the received signal strength level for each active STA then newly allocates time allocation for all STAs. Based on the updated information, the AP 14 can determine which stations are hidden from each other. If the received signal quality degrades below a set limit, a subsequent frame message from the AP 14 to the active STAs is transmitted to designate time allocation for multiple peer-to-peer transmissions.

For the reasons as set forth above, the examiner contends that the rejection to 1,3-20,22-39, and 41-48 is proper.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC E. REGO whose telephone number is (571)272-8132. The examiner can normally be reached on Monday-Friday, 9:00 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duc M. Nguyen can be reached on 571-272-7503. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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